

Assimilation of GPM GMI rainfall product with WRF GSI

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The Global Precipitation Measurement (GPM) is an international mission to provide next-generation observations of rain and snow worldwide. The GPM built on Tropical Rainfall Measuring Mission (TRMM) legacy, while the core observatory will extend the observations to higher latitudes. The GPM observations can help advance our understanding of precipitation microphysics and storm structures. Launched on February 27th, 2014, the GPM core observatory is carrying advanced instruments that can be used to quantify when, where, and how much it rains or snows around the world. Therefore, the use of GPM data in numerical modeling work is a new area and will have a broad impact in both research and operational communities.

The goal of this research is to examine the methodology of assimilation of the GPM retrieved products. The data assimilation system used in this study is the community Gridpoint Statistical Interpolation (GSI) system for the Weather Research and Forecasting (WRF) model developed by the Development Testbed Center (DTC). The community GSI system runs in independently environment, yet works functionally equivalent to operational centers. With collaboration with the NASA Short-term Prediction Research and Transition (SPoRT) Center, this research explores regional assimilation of the GPM products with case studies.

Our presentation will highlight our recent effort on the assimilation of the GPM product 2AGPROFGMI, the retrieved Microwave Imager (GMI) rainfall rate data for initializing a real convective storm. WRF model simulations and storm scale data assimilation experiments will be examined, emphasizing both model initialization and short-term forecast of precipitation fields and processes. In addition, discussion will be provided on the development of enhanced assimilation procedures in the GSI system with respect to other GPM products. Further details of the methodology of data assimilation, preliminary result and test on the impact of GPM data and the influence on precipitation forecast will be presented at the conference.
